PATENT ABSTRACTS OF JAPAN

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(54) SEMICONDUCTOR SUBSTRATE AND MANUFACTURE THEREOF

(57)Abstract:

PURPOSE: To obtain a semiconductor substrate with a GaAs layer, which is low in dislocation density and is formed on a substrate, by a method wherein the semiconductor substrate is formed into one of a substrate, wherein the GaAs layer is formed on the substrate, superlattice structure layers, which respectively consist of an AlAs layer and a GaAs layer, are formed on the GaAs layer and a GaAs layer is formed on the superlattice structure layer.

CONSTITUTION: A semiconductor substrate is formed into one of a structure wherein a GaAs layer 3 is formed on a substrate 1, superlattice structure layers 6, which respectively consist of an AlAs layer 4 and a GaAs layer 5, are formed on the layer 3 and a GaAs layer 7 is formed on the layer 6. For example, a polycrystal-shaped GaAs buffer layer 2 is grown on an Si substrate 1 in a thickness of about 10nm at 450° C and thereafter, the layer 2 is heated up to 700° C and a GaAs single crystal layer 3 is grown in a thickness of 2.0 μ m. Then, an AlAs layer 4 of a thickness of about 50nm is formed at 450° C using an ALE method and thereafter, the layer 4 is heated up to 700° C and a GaAs layer 5 of a thickness of about 100nm is grown using an MOCVD method. A growth process of a superlattice structure layer 6 consisting of the above layers 4 and 5 is repeatedly executed a plurality of times and after that, a GaAs layer 7 of a thickness required for a device is grown at 700° C using an MOCVD method.
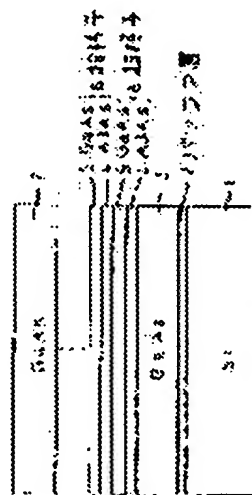
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